

## PROCEDURE OF TESTS AND EXPLANATION

### OF REPORTS OF MUNITION AND OTHER LIMIT GAGES.

#### I. Nature of Test:

The verification of limit gages at the Bureau of Standards includes the measurement of the gaging dimensions and a comparison of the measurements found with authorized drawings or specifications. In the test of precision gages and end standards the actual length at 68° F is certified together with the flatness and parallelism of the gaging surfaces.

#### II. Acknowledgment:

Upon receipt of a lot of gages, an acknowledgment is prepared on Form 339a which shows the lot number, the date gages were shipped - if obtainable from a shipping memorandum, the date gages were received, sender's invoice number, and any discrepancy in quantity and any apparent defects or damages that may have occurred in transit. Disposition of the gages after test is also indicated.

#### III. Identification of Gages:

When gages are received at the Bureau of Standards in Washington, test numbers or lot numbers are assigned. These numbers, which will be referred to hereafter as lot numbers, are etched on the gages and indicate the incoming shipment number, and also identify the individual gages in each shipment. The lot number is distinguished from other numbers such as the serial and drawing numbers of the Ordnance Department and manufacturers' serial numbers by the letter "L". For example, the gage that bears the number L97-33 is identified as the 33rd gage in the 97th incoming lot. If that particular gage is submitted for test more than once it will always be reported under its original number, L97-33, but laboratory records will show the results of each test made on that gage.

At the Branch Gage Laboratories that were conducted by the Bureau of Standards during the war but have since been discontinued, the letter "L" was replaced by the letters "N", "C" and "B" to designate New York, Cleveland, and Bridgeport lots, respectively.

#### IV. Procedure of Test:

It is the practice of the Bureau of Standards in testing gages to have independent measurements made by two different inspectors who generally use different apparatus and, whenever practicable, different methods. A third person judges as to whether the results check properly and prepares a report of approval or rejection depending on whether or not the gages have been found to meet the drawing or specification requirements.



## V. Test Fees:

Services of the Gage Section, described more fully in Communication B513, are available free of charge, except the routine testing of manufacturers' gages and such other work as would only be of interest and value to the parties requesting the work. Gages to be used on Government work are inspected free of charge. For other tests the following schedule of fees applies:

Precision blocks, submitted in sets .....	\$ .25 each
Plain, plug, ring or snap gages, flat or round end-standards .....	.50 "
Precision tests of end-standards .....	1.00 "
Measurement of any one element, such as lead, angle, or diameter of thread plug gages .....	.50 "
Complete measurement of thread gages .....	1.00 "
Measurement of lead or angle of thread ring gages ....	.50 "
(Double ended thread gages are considered as two gages in the above schedule of fees).	
Photograph of thread form, enlarged 50 to 75 times, of plug or ring thread gages .....	.25 "
Profile gages, jigs, fixtures, measuring instruments, etc. (Fee depends on complexity) .....	1.00 and up.

Whenever it is possible to determine the exact fee from the above schedule, the fee should be sent when the gages are submitted for test.

## VI. Report:

The report of inspection is prepared on Form 340a and is intended to give in the briefest way all information available. Each gage is identified in the report in as many of the following ways as possible:

- Bureau of Standards lot number.
- Number and date of drawing according to which the gage is inspected.
- Serial numbers, if different from drawing number.
- Type of gage and name of part to be gaged.
- The principal gaging dimension, or dimensions, and tolerances.

A gage is "Approved" when it meets fully the specifications. If the word "Approved" is followed by "M.I.", "I", or "W.G.", the gage is certified as falling within Ordnance Department tolerances for Master Inspection, Inspection, or Working Gages, respectively. If a gage fails to meet requirements, it is reported "Rejected" and





the faulty dimensions only are reported in the column at the right, while opposite these dimensions appear the corresponding nominal dimensions with tolerances. A gage, then, that has several gaging dimensions and is rejected with but one or two dimensions reported, should be understood to be satisfactory in all other dimensions. When drawings or specifications are not available to approve or reject a gage, the actual measured values are reported under "Measured Dimensions" in the column at the right.

#### VII. Sealing of Gages:

Gages that have been approved according to Ordnance or official drawings are etched with a seal bearing the letters "USBS". If the gage falls within master inspection tolerances the border of the seal is round, while if the gage falls outside the master inspection tolerances but within the inspection tolerances, the seal is square in outline. Gages which pass working gage tolerances only are not sealed.

#### VIII. Information Desired With Gages Submitted for Test:

It is desired that gages submitted for test be accompanied by drawings or specifications according to which the gages may be inspected. It is particularly desired that the important dimensions in complex gages be indicated and that the required accuracy be stated in order that intelligent inspection may be made. In the case of gages purchased for Government use, drawings can be secured directly by this Bureau from the department interested. Information should, however, be given as to official drawing number and revision date according to which the gages were made. Shipping instructions for approved and rejected gages should also be given as well as names and addresses of parties to whom copies of reports should be sent.

Attention is particularly called to the necessity of always including a shipping memorandum in a package of gages. Frequently gages are received that are not readily identified by the receiving department and often packages are received with no clue as to the sender. Long delays usually occur before such shipments find their way to the proper destination.

#### IX. Care in Packing:

Attention is also called to the importance of careful packing, as experience has shown that because of their weight, gages are not only damaged in transit but occasionally break through packages and are entirely lost. As shipments sometimes suffer delays in transit, or may be left out in the open, a liberal use of grease on all gaging surfaces is highly advisable to prevent rust.

#### X. Shipping Address:

Shipments and correspondence regarding gage matters should be addressed for the attention of the Gage Section, Bureau of Standards, Washington, D. C.





